Investigating the Irish English PEN-PIN merger: patterns and origins

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ABSTRACT

This study investigates the status and sociolinguistic patterning of the PEN-PIN merger in the English of L1 Irish speakers. An Irish origin has been suggested for the merger, which has been reported for (south)western Irish English varieties. By quantitatively investigating the merger in L1 Irish speakers' English alongside (i) their Irish and (ii) monolingual English of the same region, this study aims to shed light on its possible Irish influence. English DRESS tokens (n=530) from 12 L1 Irish speakers were acoustically and statistically analysed alongside (i) the same speakers' Irish /ɛ/ tokens (n=142) and (ii) English DRESS tokens (n=503) of 12 monolingual English speakers. Results show that the bilingual speakers demonstrate a more advanced PEN-PIN merger than monolinguals. A similar merger in the bilingual speakers' Irish was not found. These findings advance our knowledge of this understudied English variety and challenge an Irish source theory for the PEN-PIN merger.

Keywords: Irish English, PEN-PIN merger, DRESS-raising, language contact, sound change.

1. INTRODUCTION

A PEN-PIN merger, in which the DRESS vowel is raised in pre-nasal position, has been reported for western and southwestern varieties of Irish English (IrE). Descriptions of these varieties dating back as far as the 15th century [1] indicate that DRESS-raising was once an unconditioned process that has gradually become nasally-conditioned. Although this is generally acknowledged, there is a lack of modern quantitative data confirming this pattern.

Regarding the social conditioning of the PEN-PIN merger in western IrE, Peters [1] found it to be more common among older speakers, indicating its recession. However, this observation was based on a small dataset (3 speakers) and, as acknowledged by Peters, remains to be verified with additional data. With the exception of Peters' study, it is unclear to what extent social factors may condition the merger. Additionally, further descriptions of the PEN-PIN merger in IrE are largely anecdotal with little by way of quantitative analysis.

As is the case with many characteristic features of IrE, the origins of the PEN-PIN merger in remain elusive. Kallen [2] and Henry [3] highlight the possibility that it is a retention from Early Modern English (EModE) which, according to Wyld [4], demonstrated raising of /ɛ/ before /s, l, n/ + consonant. He supports this claim with EModE spellings such as <Gintlemen> and <till> (for 'tell'). Other linguists [5] [6] have attributed the merger to an Irish transfer source; Connacht (western) and Munster (southern) dialects of Irish reportedly have raising of mid vowels in nasal environments [5] e.g. *seinm* [ʃɪnʲəmʲ] ('playing') [7]. The mirrored geographical patterning of raised /ɛ/ between Irish and IrE adds further weight to the possibility of an Irish source.

The possibility that the merger is an independent development (external to contact-induced factors) must also be considered. Hickey [8] highlights the possibility of a more generally universal phonetic process, whereby the nasal consonant triggers vowel raising (lowering of F1) due to its formant structure, i.e. the vowel undergoes anticipatory coarticulation with its following nasal consonant.

Notably, other varieties of English, such as those of Southern US and Californian English, also display the PEN-PIN merger. The question remains as to whether these dialects have the merger due to a universal phonetic influence or due to past Irish or British English input to the Southern states.

In the investigation of an Irish influence on the PEN-PIN merger one area remaining untapped is the study of L1 Irish speakers of English. The English of these speakers reportedly exhibits extensive Irish influence [9], [5], [10]. Hypothetically, if the merger is influenced or reinforced by Irish we might expect relatively advanced merger in the English of these L1 Irish speakers.

With the aims of describing the status of the PEN-PIN merger, investigating its sociolinguistic patterning and exploring its possible Irish origins, this study addresses the following research questions:

1. To what extent do L1 Irish speakers of English show a PEN-PIN merger?
1.a If the merger is present, to what extent is it predicted by social and linguistic factors?

2. In terms of the PEN-PIN merger, how does the English of L1 Irish speakers compare with (i) their Irish (ii) the English of monolingual (English) speakers?

2. METHODS

2.1. Participants

Twenty-four participants were recruited from the Connemara Gaeltacht, an Irish-speaking region on the west coast of Ireland. Twelve of these participants were bilingual L1 Irish speakers of English (6 M, 6 F; age range 20-79, median age 38, SD 19.4); and 12 were monolingual English speakers (6 M, 6 F, age range 27-66 , median age 55, SD 16).

2.2. Data collection

Participants were recorded in quiet locations within their own homes. Recordings were made at a 44.1 kHz sampling rate via Audacity [11] using a 2017 Apple Macbook Pro and an AT2020 USB microphone. Along with a social survey, all participants completed a short semi-structured interview in English and read a set of English sentences containing monosyllabic words from the DRESS (incl. PEN) and KIT lexical sets. The L1 Irish participants recorded an additional Irish dataset, comprising a short semi-structured interview and a series of sentences. The 3 resulting datasets were: (i) English and (ii) Irish of bilingual speakers; (iii) English of monolingual speakers.

2.3. Analysis

Recordings were transcribed and segmented in Praat [12]. A Praat script was written to extract F1 and F2 measurements for all vowel tokens at midpoint. For L1 Irish speakers a total of 983 English vowel tokens were collected (530 DRESS; 453 KIT), along with 281 Irish tokens (142 /ε/ and 139 /ɪ/). For monolingual English speakers 855 tokens were collected (503 DRESS; 352 KIT). To facilitate interspeaker comparison, the formant measurements were Z-score normalized in R [13].

The normalized F1 and F2 measurements were visualized in various iterations on 2D density plots using the *ggplot2* [14] package in R. This facilitated exploratory analysis of the data, including the identification of distributional patterns and central tendencies of the vowel categories. Three vowel categories were plotted for each dataset: (i) /ɪ/ vowels (English KIT) (ii) pre-nasal /ε/ (English PEN) (iii) pre-oral consonant /ε/ (English DRESS).

Statistical analysis was subsequently carried out to further quantify the presence of a merger. Pillai scores were calculated (via MANOVA tests in R) to measure the degree of overlap between vowel categories for each speaker [15]. Pillai scores range from 0 to 1 with a lower score indicating greater overlap between categories, i.e. a more advanced merger.

To investigate the social patterning of the merger, multiple linear regression models, using *lme4* [16] were run for each dataset. By-speaker Pillai scores were analysed as the dependent variable with predictors of age, sex, local attachment score (LAS), linguistic profile score (LPS). The latter variable was created to account for variation present in speakers' language use, proficiency and dominance beyond a binary monolingual-bilingual measure.

3. RESULTS

As seen in Figure 1, there is a clear difference in the height of pre-nasal /ε/ (PEN) vowels between bilingual (L1 Irish) and monolingual (English) groups. The former group show more advanced pre-nasal /ε/-raising (i.e. a PEN-PIN merger).
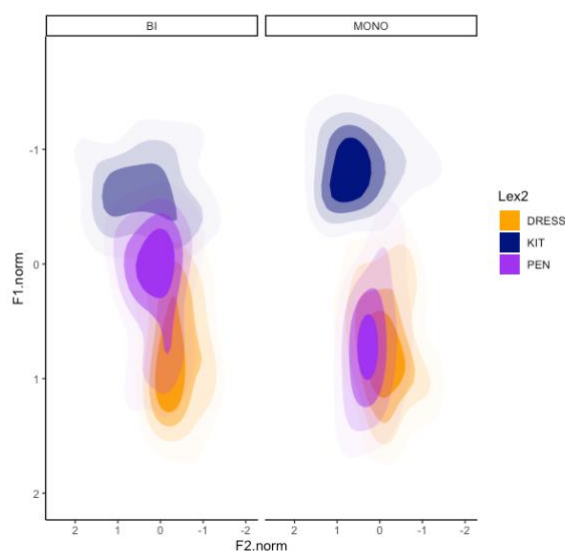

Figure 1. Distribution of English DRESS, PEN and KIT for bilingual (Irish-English) and monolingual (English) speakers.

This variation was reflected in the by-speaker Pillai scores which ranged from 0.02 (bilingual speaker with advanced merger) to 0.71 (monolingual speaker

with distinct vowel categories). On average, bilingual speakers scored 0.21 and monolinguals 0.49, i.e. the PEN-PIN merger was notably more advanced for bilingual speakers.

Regarding the effect of social factors, the multiple linear regression model for bilingual speakers revealed both speaker sex and age to be significant predictors of merger (both p<.05), with no age-sex interaction effect. Males and older speakers were more likely to show merger. Overall, the model accounted for a significant amount of variance in the bilingual speakers' Pillai scores (F(4,7)=4.13, p<.05, R^2=.70, $R^2_{adjusted}$=.53). The positive correlation between increased speaker age and Pillai score is seen in Figure 2.
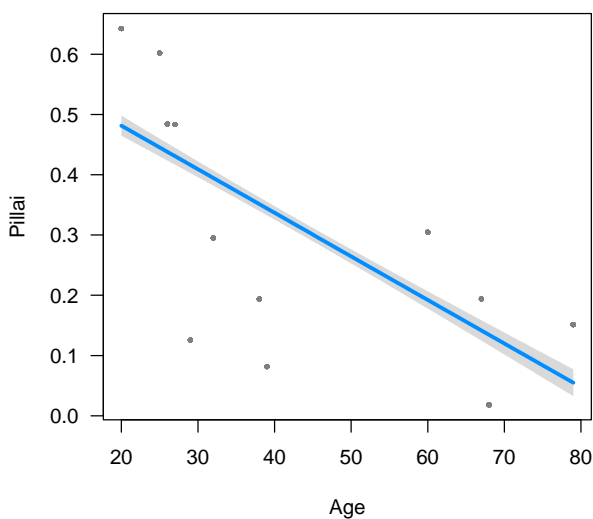

Figure 2. Relationship between bilingual speaker Pillai score and age.

For the monolingual speakers, the multiple linear regression model did not reveal any significant predictors of merger. Figure 3 demonstrates the by-sex distributional patterns of bilingual and monolingual speakers. There is a clear lack of variation between Pillai scores for monolingual males and females when compared to the bilingual speakers.

Analysis of the bilingual speakers' Irish /ɪ/ and pre-nasal /ɛ/ vowel tokens found a Pillai score of 0.3. However, when visualized, it is evident that the distributional pattern of these Irish vowels greatly differs from that of the English. For example, as seen in Figure 4, older speakers (age 50+) show prominent fronting of Irish pre-nasal /ɛ/ vowels.
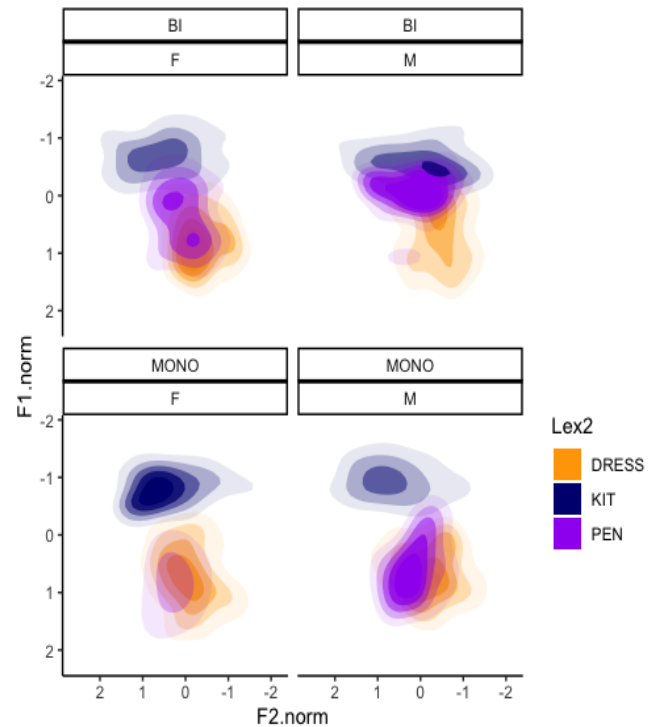

Figure 3. By-sex distribution of English DRESS, PEN and KIT for bilingual (Irish-English) and monolingual (English) speakers.
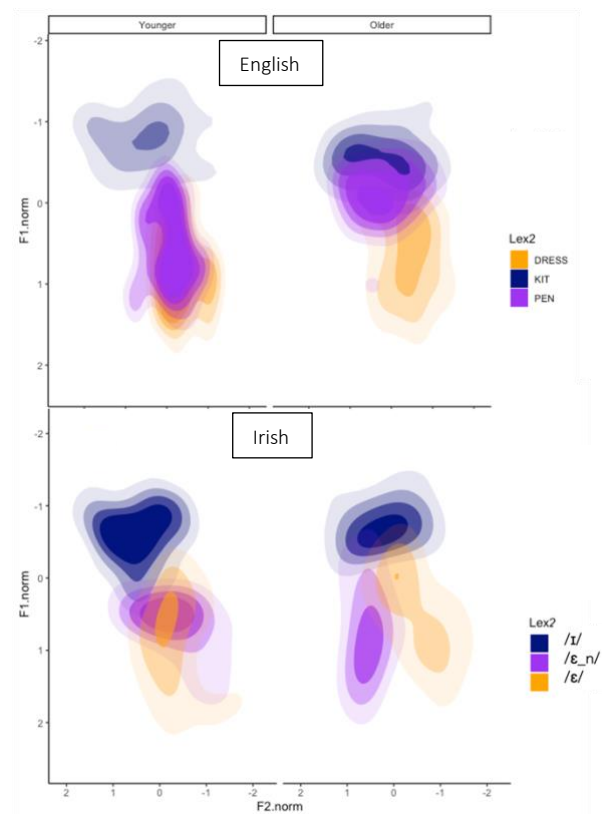

Figure 4. By-age distribution of bilingual speakers' English and Irish vowel tokens.

Additionally, the bilingual speakers' Irish vowels did not mirror their English by-sex distributional pattern. The bilingual male speakers clearly demonstrated a more advanced English PEN-PIN merger than the females. However, the Irish data suggests fronting of the pre-nasal /ɛ/ vowel for male speakers, with no clear raising pattern.
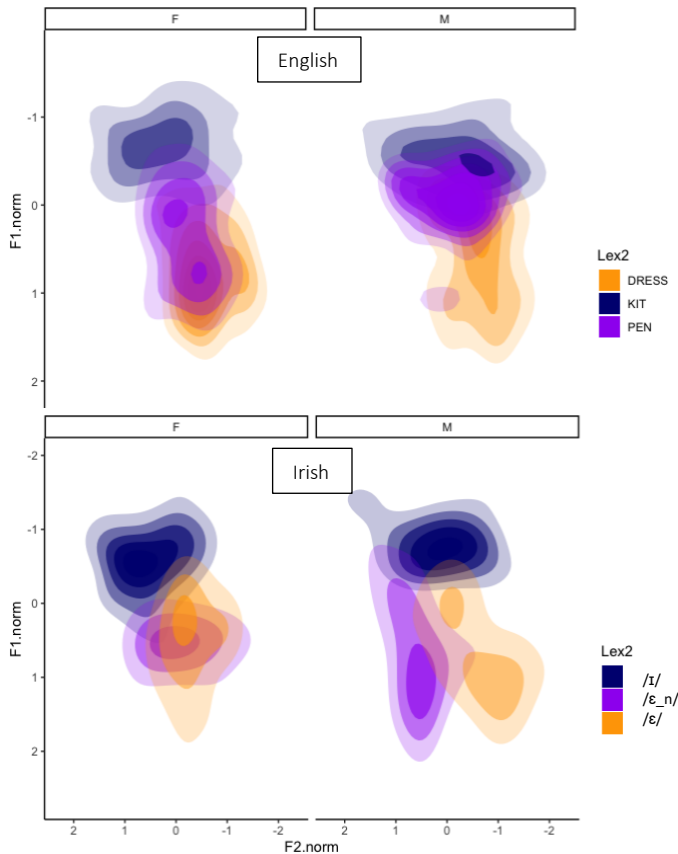

Figure 5. By-sex distribution of bilingual speakers' English and Irish vowel tokens.

4. DISCUSSION AND CONCLUSION

This study aimed to shed light on the status and sociolinguistic patterning of the PEN-PIN merger in Connemara Gaeltacht English. As the first to quantitatively analyse vowel data from Irish-English bilinguals' both languages, alongside monolingual English data, a secondary aim was to investigate the possible Irish influence on the PEN-PIN merger.

Regarding the sociolinguistic patterning of the merger, this study's findings support Peters' [1] claim that the PEN-PIN merger is a receding feature in western IrE; while monolingual speakers did not show any clear merger pattern, increasing age was

found to be a significant predictor of merger for bilingual speakers. This correlation between speaker age and degree of merger is suggestive of an ongoing sound change.

Relative to monolingual English speakers, the L1 Irish bilinguals showed more advanced PEN-PIN merger overall. On first inspection, this pattern could be taken to suggest that the bilingual speakers PEN-PIN merger must be attributed to their L1 Irish. However, an investigation of these speakers' Irish vowels suggests that there is no pre-nasal /ɛ/-raising to mirror that of their English. Interestingly, there appears to be a distinct pattern of distribution within their Irish, i.e. fronting of pre-nasal /ɛ/. This finding is significant for two reasons: (i) it has not been previously reported for this dialect of Irish and (ii) it challenges the idea that Irish has played a significant role in the presence of the PEN-PIN merger in Irish English.

Although the origins of the PEN-PIN merger cannot be definitively proven, these preliminary findings cast doubt on Irish reinforcement of merger in these speakers. In departure from past claims of Irish origins, it appears that in this group of bilingual speakers, Irish does not play an essential role (e.g. reinforcement/transfer) in the presence of /ɛ/-raising in their English. This advances our knowledge of the English of L1 Irish speakers and adds much-needed data-driven findings to the existing linguistic descriptions of IrE. It is hoped that this study, as the first of its kind, will be considered a move toward more quantitative data and analyses for the field of Irish English linguistics and will encourage the analysis of Irish data alongside English in the investigation of Irish influence on Irish English.

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